Technical Report 994

The Interrelationships of Child-Care Use, Spouse Employment, Army Satisfaction, and Retention in the U.S. Army

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U.S. Army Research Institute

January 1994

United States Army Research Institute for the Behavioral and Social Sciences

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency Under the Jurisdiction of the Deputy Chief of Staff for Personnel

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	1994, January	Final Oct 92 - Oct 93

4. TITLE AND SUBTITLE
The Interrelationships of Child-Care Use, Spouse Employment, Army Satisfaction, and Retention in the U.S. Army

5. FUNDING NUMBERS
62785A
790
1311
H01

6. AUTHOR(S)
Lakhani, Hyder A.; and Hoover, Elizabeth

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Research Institute for the Behavioral and Social Sciences
ATTN: PERI-RP
5001 Eisenhower Avenue
Alexandria, VA 22333-5600

8. PERFORMING ORGANIZATION REPORT NUMBER
ARI Technical Report 994

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
--

10. SPONSORING / MONITORING AGENCY REPORT NUMBER
--

11. SUPPLEMENTARY NOTES
--

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited.

12b. DISTRIBUTION CODE
--

13. ABSTRACT *(Maximum 200 words)*

This report analyzes the interrelationships of child-care use, the Army wife's employment/earnings, her satisfaction with Army life, and her desire for soldier retention in the Army. Data from the Survey of Army Families 1986/87 and 1991/92 are analyzed using regression equations. The results reveal that child-care use increases with an increase in the Army wife's employment and earnings and vice versa. An increase in Army wife's satisfaction with child-care use increases her satisfaction with Army life that, in turn, enhances her desire for soldier husband's retention in the Army. Since retention is increased, providing child-care services is likely to be cost-effective compared with the alternative--recruiting and training a soldier.

14. SUBJECT TERMS
Child-care use
Spouse employment and earnings
Spouse's satisfaction with Army life

15. NUMBER OF PAGES
53

16. PRICE CODE
--

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	Unlimited

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The Interrelationships of Child-Care Use, Spouse Employment, Army Satisfaction, and Retention in the U.S. Army

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Department of the Army

January 1994

Army Project Number
2Q162785A790

Human Performance Effectiveness and Simulation

FOREWORD

The Leadership and Organizational Change Technical Area of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) conducts research in the areas of soldier retention, readiness, leadership, organizational change, and family factors. Questions have recently arisen about the Army's ability to determine the use of child-care services and their effect on retention.

This report quantifies the determinants of child-care use and its impact on spouse employment and earnings. These, in turn, affect Army spouses' satisfaction with Army life and their desires for retention of soldier husbands in the Army.

This research is being conducted under a Letter of Agreement (LOA) between the ARI and the U.S. Army Community and Family Support Center (USACFSC) entitled "Sponsorship of ARI Army Family Research." An earlier draft of this report was submitted to Richard Fafara, USACFSC, and D. Rojas, Army Child Development Services. The results of this research will help these agencies plan and improve the development and use of child-care services at Army installations in and outside the Continental United States.

EDGAR M. JOHNSON
Director

THE INTERRELATIONSHIPS OF CHILD-CARE USE, SPOUSE EMPLOYMENT, ARMY SATISFACTION, AND RETENTION IN THE U.S. ARMY

EXECUTIVE SUMMARY

Requirement:

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) conducts research on manpower, personnel, training, and human factors of significance and interest to the U.S. Army. Questions have been raised about the benefits of the Army's programs of child care and its effects on Army families.

Procedure:

The authors analyzed data from Army wives in the Survey of Army Families (SAF) 1987 (SAF1) and 1991-92 (SAF2). A sample of 1,007 spouses of enlisted soldiers and 2,646 wives of officers was analyzed from SAF1 and a sample of 290 spouses of both enlisted and officers' wives from SAF2 was analyzed. Descriptive statistics and regression equations (ordinary least squares and three stage least squares) were used to identify the determinants of child-care use, wives' earnings, wives' satisfaction with Army life, and their effects on wives' desires for soldier retention in the Army.

Findings:

The results suggest that child-care use increases with an increase in the spouse's employment and earnings and is not related to the soldier's earnings. As expected, child-care use was greater for the younger age groups, 0-2 years and 3-4 years, and was less for 5-12 year olds. An increase in the wife's satisfaction with child care tends to be associated with an increase in her satisfaction with Army life that, in turn, enhances her desire for soldier husband's retention in the Army. These findings are valid for both enlisted soldiers and the officers and were confirmed for both SAF1 and SAF2 databases.

Utilization of Findings:

This research was sponsored by U.S. Army Community and Family Support Center for the Office of Child Development Services. The findings can be used to determine the demand or use of child-care services based on the number and age distribution of children and the extent of wives' employment. The findings are also useful to Army policymakers because they show that the child-care expenditures are cost-effective in increasing wives' satisfaction with Army life, which, in turn, tends to increase their desires for soldier retention in the Army.

THE INTERRELATIONSHIPS OF CHILD-CARE USE, SPOUSE EMPLOYMENT, ARMY SATISFACTION, AND RETENTION IN THE U.S. ARMY

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THE INTERRELATIONSHIPS OF CHILD-CARE USE, SPOUSE EMPLOYMENT, ARMY SATISFACTION, AND RETENTION IN THE U.S. ARMY

LITERATURE REVIEW, THEORY, METHOD, AND DATA

The labor force participation rate of married women is significant and increasing in both the civilian and the military sectors. In 1987, in the civilian sector, for women aged 25 to 54, this rate was 68 percent and growing (Shank, 1988). In the same year, in the military sector, the proportion of employed spouses of enlisted soldiers was about the same at 67 percent and growing (Griffith et al., 1988). One of the reasons for this growth is the availability of child care. Compared to the demand for child care of civilian spouses, however, the Army child care demand is likely to be greater because of three special requirements. First, the Army relocates soldiers for permanent change of station (PCS) every few years. This requires separations from extended family that could help provide child care. Second, the Army deploys soldiers frequently to distant and long-term training exercises so that absence of the father requires greater use of child care. Third, long-term locations of soldiers outside the continental United States (OCONUS), in Europe and Korea, involve language and communications barriers that discourage the use of foreign child care centers.

An objective of this paper is to determine factors that contribute to child care use. The use of child care is then related to earnings of wives of the soldiers: Is an increase in use associated with an increase in spouse earnings? We also attempt to determine the variables that are associated with a wife's satisfaction with Army life (SAL), and how SAL affects a wife's desire for her husband's retention in the Army. The labor-leisure model deals with a wife's allocation of time for leisure or for work outside the home for pay or for work inside the home as a homemaker. We analyze retention because only about one-third of the first-term soldiers decide to stay. This problem is likely to become more acute in the future because of the on-going downsizing of the Army, which will reduce promotion opportunities and hence increase turnover. Lakhani (1991) reports that more junior enlisted soldiers planned to leave the Army after Operation Desert Shield/ Storm compared to when they jointed the Army: 26% versus 18%.

Literature Review

Recently, considerable research has been done on the reasons for the increased labor force participation rate of women. For example, Journal of Human Resources had a 1992 special issue on child care and its effects on earnings of mothers. Blau & Hotz (1992), who edited the special issue, noted that one of the most important changes in the composition of the U.S. work force over

this century has been the increasing participation of women. To a great extent, this change has been facilitated not only by the availability of greater employment opportunities for women but also by considerable expansion and use of child care facilities. Ruopp et al. (1979) noted that the use of child care facilities was a function of age of child, parental employment status, and family structure, rather than race or ethnicity. Klerman & Leibowitz (1990) concluded that the generous tax treatment of child care expenses, along with improved market opportunities for women, promoted earlier return to work among new mothers in the 1980s. Michalopoulos et al. (1992) developed a simultaneous structural equations model of hours of child care purchased, mother's earnings, and quality of care purchased. They concluded that the short run labor supply elasticities (i.e. an increase in the percentage of women joining the labor force) with respect to wages, non-labor income, and child care subsidies were low, but statistically significant, for both married and single mothers. They also noted that similar low elasticities were obtained by Blau & Robbins (1988). Unlike Michalopoulos et al. (1992), Ribar (1992) concluded that the elasticities estimated by them were higher relative to those obtained by Michalopoulos et al. (1992). Ribar also noted that the higher child care costs reduced the likelihood of utilization of child care. Mroz (1987) used husband's earnings as a proxy for non-labor income and concluded that it was exogenous to the wife's labor supply.

Unlike the theoretically expected results of the preceding studies, two studies obtained some counter-intuitive results. First, Hofferth & Wissoker (1992) concluded that an increase in the mother's hourly wage did not increase her expenditure on child care. Second, Leibowitz et al. (1992) concluded that increases in wages and income did not result in a significant increase in market-based (relative to non-market-based) child care. Finally, Leibowitz et al. (1992) also noted that parents did not pay more to purchase higher quality care.

The available literature on child care in the military sector is mostly descriptive instead of quantitative. Wasserman (1989) reported that since 1980, the Army had approved 96 facilities with a total construction cost estimate of $177 million, and had managed more than 600 Child Development Centers (CDCs) and 12,000 Family Care Homes (FCHs) with a daily attendance of 80,000 children. Lakhani & Ardison (1991) noted that Army officers used the more formal CDCs and enlisted soldiers used the informal FCHs because the officers, with higher earnings, could better afford to purchase the more expensive CDCs than the enlisted soldiers. Datta & O'Keefe (1991) concluded that the weekly cost of care for families with preschoolers in the U.S. Navy and the civilian sector was $74 and $68 respectively; for families with school age children the corresponding costs were $46 and $29 respectively.

The effect of family programs, such as child care services, on an Army spouse's satisfaction with military life has been supported in several studies (Lakhani, 1991). The influence of the spouse on the retention behavior of a soldier has also been demonstrated in several studies (Gade et al., 1988). There is, however, an absence of integration of a spouse's use of child care, her earnings, her satisfaction with Army life, and its effect on her desire for soldier-husband retention. Lakhani (1988) suggested that the reenlistment was cost-effective for the Army relative to recruiting an additional soldier for replacement. Also, the retention rate of Black soldiers has always been greater than the rate of White soldiers (Lakhani & Gilroy, 1984).

Theory

Our decision-making unit is a household consisting of an Army spouse, at least one child, and a husband who is an Army soldier. We assume that the household maximizes a separable utility function:

$$(1)\quad U = [X, L, C]$$

where

X = consumption of a composite commodity (proxy) for consumption of all goods and services, except child care services) with price normalized to one;

L = leisure (defined as time not working) of the spouse, assuming that the utility of leisure decreases with an increase in age of the child;

C = children, their number and age distribution.

It is assumed that L is discrete: the wife either works or does not work. The budget constraint faced by the family consists of the wife's and the soldier's labor earnings equation (eq.2). We assume that there are no savings or borrowing. Thus, households spend their earnings on consumption goods and on child care:

$$(2)\quad Y_f = Y_h + Y_w = X + CC$$

where

Y_f = total family income;

Y_h = husband's income;

Y_w = wife's earnings;

CC = consumption of child care.

While the husband's earnings are assumed to be exogenous, the log of spouse's earnings (eq.3) are stipulated, as in Leibowitz et al. (1992), as a function of her labor force participation and the following variables:

(3) log Y_W = f[LFP, CC, Age, Age^2, WEdu, R] e1

where

log Y_W = log of wife's earnings in 1986;

LFP = wife's labor force participation: months worked in 1986;

CC = consumption of child care;

Age = wife's age;

WEdu = wife's education;

R = wife's race; White = 1, Black = 0;

e1 = error term.

We did not include the Continental United States (CONUS) variable in this eq. because it was correlated with LFP of the wife. Its inclusion would have created a problem of muticollinearity.

The demand for child care (CC) (eq.4) is stipulated as:

(4) CC = g[log Y_W, NC, YC, log WW, VT, log Y_H, HEd, R, Age, Age^2, WEdu, OCONUS] e2

where

log Y_W = estimated value of log Yw, from eq.3;

NC = number of children less than 6 years;

YC = age of the youngest child;

log WW = log of wife's wage ($/month);

VT = volunteer time spent in civilian organizations;

log Y_H = log of husband's earnings for non-labor income;

HEd = husband's education;

OCONUS = outside continental U.S. location;

e2 = error term.

An increase in an Army wife's use of child care services, and the potential increase in her employment and earnings, is postulated to increase her satisfaction with the Army way of life (SAL). The SAL is specified as:

(5) SAL = j[CC, NC, DCCC, LFP, R, log Y_H] e3

where

CC = estimated value of child care used, from eq.4;

DCCC = spouse's dissatisfaction with cost of child care services = 1, else = 0;

e3 = error term.

It is hypothesized that an increase in a spouse's labor force participation (LFP) and her husband's earnings (Y_H) will be positively related to her satisfaction with Army life (SAL) because of an associated increase in the economic well-being of the family. An increase in child care (CC) used is expected to increase her SAL because it increases her leisure and/or her opportunities to look for work, or follow other social pursuits. Her dissatisfaction with the cost of child care (DCCC) services is hypothesized to reduce her SAL.

Finally, a spouse's desire for her husband's retention in the Army (DHR) is postulated as follows:

(6) DHR = k[LFP, SAL, YOS, R] e4;

where

SAL = estimated value of SAL, from eq.5;

YOS = soldier's years of active duty service;

e4 = error term.

Eq.1 (1) through (6) are postulated as linear relations.

Data, Hypotheses, and Method

For this chapter, we used the U.S. Department of the Army (1987) Survey of Army Families, or SAF1, for survey data from Army spouses. These data revealed that three-fourths of these spouses had children and two-thirds of them used some form of child care. Also, 73% of children were receiving some form of child care

(Griffith et al., 1988). These data are comparable with civilian child care statistics. These data are presented in Appendix Table 1. Descriptive data for SAF1 are not discussed in this report but were discussed in Lakhani and Ardison (1991).

To obtain a wife's monthly wage rate, we simply divided her 1986 earnings by the number of months worked in 1986. Earnings of soldiers, a proxy for non-wage income of the spouses, were developed from Army pay tables, given the available information on soldiers' ranks, years of service, and their marital status for computation of gross earnings (which included Basic Allowance for Quarters). The dollar values of these earnings were converted into natural logarithms because Ribar's (1992) and Lakhani's (1988) estimates, as well as our own estimates revealed that the log values resulted in a better fit relative to non-log estimates.

As in the human capital theory (Becker, 1975), in eq. 3, we hypothesized the spouse's earnings as a positive function of education and age and a negative function of age-squared. An increased use of child care was expected to relate positively to her earnings.

To estimate the demand for child care, as in eq.4, we hypothesized that an increase in either the spouse's or the husband's earnings, or the spouse's wage rate, would tend to increase child care used, given the number and age distribution of children. We used the earnings variable in addition to the wage variable because many Army wives tend to be underemployed in terms of hours worked due to the fact that they frequently move with Permanent Change of Station (PCS) of their husbands (Payne et al., 1992). Hence the spouses fail to get career progressive jobs because the employers do not train them for firm-specific human capital since they cannot recoup their training costs over the short period of their employment. The extent of underemployment can be seen from Appendix Table 1: the annual earnings of only $6,638 despite the monthly wage of $868 which would have resulted in a pro-rata annual earnings of $10,416, not $6,638.

The higher age of a child was hypothesized to reduce the hours of child care used because the child would then be going to school. An increase in volunteer time spent by a spouse in civilian organizations was expected to increase the use of child care. We also hypothesized that spouses located outside the continental United States (OCONUS) would tend to use greater amounts of Army-provided child care facilities relative to Army spouses located in CONUS because, as noted above, the former, located in Europe and Korea, faced language and communications barriers in the use of non-Army child care services.

In eq. 5, we hypothesized a spouse's satisfaction with Army

life (SAL) to relate positively to: (1) her labor force participation rate, and (2) her husband's earnings. The SAL was hypothesized to relate negatively to her dissatisfaction with child care cost. The variable scale for spouse's SAL was positive: 1 = very dissatisfied, 2 = dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = satisfied, and 5 = very satisfied. An increase in husband's earnings was expected to increase her SAL since it increased family income. We also hypothesized that when a spouse was dissatisfied with the cost of child care services (dummy variable, dissatisfied = 1, else = 0) compared to those who were satisfied with child care or did not use child care, she would be dissatisfied with Army life. The survey data for this variable ranged from: 1 = very satisfied with the cost of Army child care services, to 5 = very dissatisfied. We selected values 4 or 5 and re-coded them as a dummy variable = 1, else = 0. We did not include a wife's earnings as an explanatory variable because of its correlation with the husband's earnings (Benham, 1982).

Finally, in eq. 6, we hypothesized that a wife's desire for her husband to stay in the Army relates positively to: (1) her own SAL, (2) her labor force participation rate, (3) her race [because, according to Lakhani & Gilroy (1984), Blacks tend to be more satisfied and hence stay in the Army longer than non-Blacks.] The husband's years of service (YOS) variable represented promotion potential and vesting of retirement benefits. The data for the spouse's choice for her husband's retention in the Army were the survey responses whose values varied from 1 = not to stay, to 4 = stay until retirement.

We used the method of three stage least squares (3SLS) because we hypothesized that the four equations were inter-related so that their error terms were correlated. Thus, while an increase in child care used tends to increase a spouse's employment and earnings, an increase in her earnings also increases the demand for child care. Furthermore, an increase in her labor force participation and earnings tends to increase her SAL. An increase in her SAL, in turn, tends to increase her desire for her husband's retention in the Army.

RESULTS AND DISCUSSION--WIVES OF ENLISTED SOLDIERS

Tables 1 and 2 respectively show the results of regressions specified in eqs. (3)-(4) and (5)-(6). Even though all of these four equations were estimated simultaneously as a system, we report them in two separate tables for conciseness and clarity of presentation. The results of all four equations reveal that almost all of the coefficients have the hypothesized signs and most of them are also statistically significant.

Child Care Demand and Wives' Earnings

Table 1 shows that the estimated coefficients for the log of wives' pre-tax earnings in column 1, eq. (3), and their hours of child care used in col. 2, eq. (4) are, as hypothesized, positively interdependent: an increase in child care use tends to increase their earnings (Table 1, Eq.3). An increase in their earnings is also associated with an increase in their use of child care (Table 1, Eq.4). Eq.(3) also shows that, as expected, child care use decreases if a child is older. Finally, an increase in the wife's wage rate results in an increase in demand for child care.

Our above referred result of the effect of an increase in spouse's wage is in accordance with theoretical expectation and is contrary to the findings of Hofferth & Wissoker (1992) and Leibowitz et al. (1992) who obtained counter-intuitive results; namely, an increase in wage reduced the demand for child care. Our results for eq. (4) also show that, consistent with the theory of human capital, an increase in a spouse's labor force participation tends to increase her earnings. Also, spouses who are White tend to earn more relative to Black spouses.

We used the coefficients in eqs. (3) and (4), respectively, to estimate uncompensated elasticities (at mean values) of child care demand and earnings. Our estimates of elasticities of child care demand for (1) wife's earnings, (2) her wage rate, and (3) her husband's earnings are 3.41, 4.47, and .81 respectively. All of these elasticities are higher than the estimates reported in civilian wives' studies of child care use. For example, Michalopoulos et al. (1992) report elasticities of child care demand of married mothers for her wage and husband's wage at .209 and .269 respectively (p.188). The higher elasticities for the Army data imply that Army families are more sensitive than civilian families in their use of child care services -- a small decrease in spouse earnings results in a substantial decrease in the use of child care services. Also, in our estimates, the elasticity of child care use for a wife's earnings is greater than the elasticity for her husband's earnings. In fact, the coefficient for the husband's earnings in Table 1 is not statistically significant so that a wife's demand for child care is related more to her own

earnings and her own wage rate instead of her husband's earnings.

Our estimates of the elasticity of spouse's earnings for (1) her labor force participation and (2) child care use are, however, considerably lower, at .004 and .001, respectively, than the estimates reported in civilian studies (Ribar, 1992). These lower earnings elasticities may be due to the fact that Army spouses do not find permanent full-time or career progressive employment because of the requirement of frequent transfers of their husbands due to military exigencies. For example, as noted above, the descriptive statistics in Appendix Table 1 revealed that, while the average monthly wage of an Army wife was $868, her annual earnings were not the pro-rated amount of $10,416 but were only $6,638. This suggests that underemployment in terms of hours of work is likely to be a factor in these lower annual earnings. Therefore, in order to increase family income, the Army policy makers should consider subsidizing the use of child care services, which, in turn, could induce increases in the earnings of Army wives.

Table 1

3SLS Coefficients of Child Care Used and Earnings of Employed Wives of Enlisted Soldiers

Independent Variables	Eq. (3) Child Care Used	Eq. (4) Log Spouse Earnings
Intercept	-464.48***	-
Kids < 6 years	- .69	-
Age of youngest child	-1.22*	-
Log of her pre-tax earnings, 1986	28.31***	-
Log of her wage rate, $/month	29.2***	-
Volunteer time	-.02	-
Log of husband's earnings, 1986	7.96	-
Husband's education	.11	-
Her race, White = 1	-10.75**	-
Her age	3.87	-
Her age squared	-.08**	-
Her education	-.84	-
OCONUS location	.60	-
Intercept	-	6.79***
Labor Force participation, months	-	.10***
Hours child care used last month	-	.01***
Her education	-	.02
Her race, White = 1	-	.16**
Her age	-	-.04
Her age squared	-	.001*
System R-squared = .464,	F = 10.84***,	N = 1,007

* Significant at the .10 level

** Significant at the .05 level

*** Significant at the .01 level

Wife's Satisfaction With Army Life (SAL) and Her Retention Desires

The estimated coefficients of eq. (5) in Table 2 show that, as hypothesized, a spouse's SAL increases with an increase in her husband's earnings. When she is dissatisfied with the cost of child care services, however, her SAL tends to decrease. Wives who are White tend to have lower SAL relative to Black wives.

The coefficients for eq. (6), Table 2, reveal that an increase in a wife's SAL is positively and significantly related to her desire for her husband to stay in the Army. Also, an increase in her husband's years of active service in the Army leads to an increase in her desire for him to stay in the Army. This result suggests that vesting of retirement benefits and promotion opportunities, which depend upon experience, appear to be good incentives for increasing retention of enlisted soldiers. Finally, Black spouses are more likely than White to desire that their husbands stay in the Army. This result may indicate that Black families perceive less discrimination and better job opportunities in the Army relative to an alternative of leaving the Army and confronting discrimination in the civilian sector.

Table 2

3SLS Coefficients of Wife's Satisfaction With Army Life and Her Desire for Enlisted Soldier's Retention

Independent Variables	Eq. (5) Wife's Satisfaction with Army Life	Eq. (6) Wife's Desire for Husband's Retention
Intercept	-2.91**	-
Kids < 6 years	.002	-
Log of husband's earnings, 1986	.659***	-
Sp.'s dissatisfaction with child care cost = 1	-.164**	-
Labor force participation, months	.013	-
Sp.'s race, White = 1	-.186***	-
Intercept	-	2.349***
Sp.'s satisfaction with Army life	-	.246*
Husband's years of service	-	.041***
Sp.'s race, White = 1	-	-.091*
System R-squared = .464		
F = 10.84***		
N = 1,007		

* Significant at the .10 level

** Significant at the .05 level

*** Significant at the .01 level

Army policy makers should note that dissatisfaction with the cost of child care services results in a decrease in a wife's SAL, which, in turn, reduces her desire for her husband's retention in the Army. Other studies (Gade et al., 1988) have shown that a spouse's desire for a soldier's retention has a significant impact on retention behavior of the soldier. The Army and the U.S. Congress might, therefore, consider subsidizing child care cost as an incentive for soldier retention. Instead, according to the Military Child Care Act of 1989, the current policy of the U.S. Congress is that the operating costs of all family programs should be paid from the operating revenues or the fees levied for the use of these programs. It may be recalled that, according to Datta and O'Keefe (1990), the cost of child care services in the military (Navy) was slightly higher than in the civilian sector. The higher cost in the military sector may be attributed to greater use due to the special military requirements noted above; namely, PCS away from extended families, husbands' frequent deployment for training exercises, and overseas location with its language and communication difficulties. All of these factors necessitate greater use of child care services in the military relative to that in the civilian sector.

Conclusions and Policy Implications

This section analyzed a sample of 1,007 spouses of enlisted soldiers and concluded that there is a positive relationship between child care use and earnings of the spouses. We also conclude that an increase in satisfaction with child care use or the husband's earnings tends to increase the spouse's satisfaction with Army life, which, in turn, increases her desire for the soldier husband's retention. Since an increase in demand for child care is directly related to an increase in the spouse's wage, or her earnings, or a younger age of the child, the Army may plan its construction and expansion of child care facilities based upon projections from these three predictors.

The Army policy makers should note that the demand for child care is related to the spouse's, not the soldier's, earnings. The Army should also note that an increase in use of child care facilities tends to increase earnings of the wives. Such an increase in earnings, or the husbands' earnings, tend to increase the wife's satisfaction with Army life, which, in turn, increases her desire for the soldier's retention. Therefore, the Army's provision of child care services at a subsidized cost is likely to be more cost-effective compared to an alternative of recruiting and training new enlisted soldiers - whose cost to the Army was $20,000 per soldier (Lakhani, 1988).

RESULTS AND DISCUSSION--SPOUSES OF OFFICERS

We conducted a separate analysis for child care use by officers because their child care needs are likely to be different from those of enlisted soldiers for several reasons. First, spouses of officers, being more educated relative than enlisted soldiers, are likely to be engaged in professional occupations. These full time occupations are likely to require different types of child care facilities, such as child development centers instead of family care homes (Lakhani and Ardison, 1991). Second, wives of officers tend to perform greater volunteering services relative to those of enlisted wives and hence would require child care services even if they are not gainfully employed. Third, officers' wives can afford to pay more for child care services because of generally higher family income, due to both the higher income of officers than enlisted soldiers, and the higher income of officers' wives who are more likely than enlisted soldiers' wives to be employed in professional occupations.

Descriptive Statistics

Appendix Table 2 presents descriptive data for the spouses of officers. This table shows that, as expected, the average annual earnings of these wives was higher ($9,765), compared to enlisted wives earnings ($7,948). The mean number of hours of civilian volunteering was also higher, 20 hours per month, versus only 4 hours per month for spouses of enlisted soldiers.

The other descriptive statistics for the officer spouses are similar to those of the enlisted. For example, the mean of officer spouses' satisfaction with Army life was 3.76 (scale 1=very dissatisfied, 5=very satisfied) compared to 3.54 for enlisted wives. Forty seven percent of the officer wives were located in OCONUS, compared to 38% of enlisted wives. Also, the mean labor force participation rate of officer spouses was 7.66, i.e., they worked for 7.66 months compared to 8.4 months for enlisted wives. Despite the lower mean labor force participation rate of the wives of the officers, however, their mean earnings were higher, as noted above, so that they were likely to have better paying jobs relative to the enlisted spouses. Officer and enlisted soldiers' wives did not significantly differ in their desire for soldier's retention, as indicated by their respective group means of 3.57 and 3.58 on the 4-point scale measuring attitude toward retention.

Regression Results

Table 3, showing the results for the interdependence of child care use and spouse earnings, reveals that the results are similar to those of enlisted spouses. For example, the first column of this table shows that an increase in the wives' annual or weekly earnings was positively and significantly associated with an

increase in the use of child care services. The use of child care services was significantly greater for White compared to non-White spouses. An increase in the age of the wife was associated with a decrease in child care used, obviously because older wives tend to have older children who do not need child care.

Column 2 of Table 3 shows the interdependence of child care use and spouse earnings. The earnings of these wives increased with an increase in the use of child care services. The earnings also increased with an increase in labor force participation rate measured in terms of the number of months worked in the last year. The earnings of White wives were also higher relative to non-Whites. An increase in age in excess of the mean age of the group of all officer wives was associated with decreased earnings, either because the older wives were less educated relative to younger ones, or they were the wives of higher ranking officers. Wives of these officers did not need to work outside their homes.

Estimation of elasticities of child care use with respect to earnings of officers' wives revealed that these were considerably smaller than the corresponding elasticities for enlisted spouses. The estimates of elasticity of child care use with respect to officer spouses' annual and weekly earnings were 0.73 and 0.0002 respectively. These values suggest that even a substantial decrease in earnings is associated with only a small decrease in child care use, perhaps because they can pay for child care use from their officer husbands' earnings. The values of these elasticities are considerably smaller than enlisted wives' elasticities at 3.4 and 4.47 respectively for their annual and weekly earnings. These higher values of enlisted wives' elasticities indicate that they depend considerably on their own earnings, not on earnings of their husbands.

The elasticity of child care use with respect to officer husband's earnings was only 0.22. This value is also considerably smaller than the corresponding elasticity with respect to enlisted soldier's earnings at 0.8. Therefore, as noted above, demand for child care by officers' spouses does not decrease as much as that for enlisted spouses'. Once again, we conclude that enlisted wives' demand for child care with respect to soldier earnings is more sensitive than officer wives' demand for child care use; enlisted wives demand for child care can decrease considerably if soldiers' earnings decrease relative to officers' earnings. Conversely, since the system is interdependent, a small decrease in child care use by enlisted wives can be associated with a substantial decrease in enlisted wives' earnings.

Table 3

3SLS Coefficients of Child Care Used and Earnings of Employed Wives of Officers

Independent Variables	Child Care used	Log of Spouse's Earnings
Intercept	-201.58**	-
Children < 6 years	-.77	-
Age of youngest child	-.82	-
Log of her pre-tax earnings, 1986	26.32***	-
Log of her wage rate, $/month	.01***	-
Volunteer time in civ. organ.	-.04	-
Log of husband's earnings, 1986	-6.24	-
Husband's education	-1.56	-
Her race, white = 1	-21.13**	-
Her age	8.82**	-
Her age-squared	-.15***	-
Her education	-.62	-
OCONUS location	2.38	-
Intercept	-	7.66***
Labor force participation, months, 1986	-	.11***
Hours child care used last month	-	.01***
Her education	-	.02
Her race, white = 1	-	.34**
Her age	-	-.11*
Her age-squared	-	.002**

System weighted R-squared = .444; F = 12.647***

N = 2,646

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 4 presents the results of the simultaneous equations for the spouse's satisfaction witn Army life and her desire for soldier retention in the Army. Column 1 of this table shows that satisfaction with Army life (SAL) of the wife increased significantly with an increase in her husband's earnings. This satisfaction level was, however, lowered when she was dissatisfied with the cost of child care services. In other words, dissatisfaction with the cost of child care services was associated with dissatisfaction with Army life.

Column 2 of Table 4 shows the positive association between the wife's desire for retention of her husband and her own satisfaction with Army life -- an increase in her satisfaction level with Army life was associated with an increase in her desire for the husband's retention. The retention desire also increased with an increase in the years of service of the officer husband, perhaps because of the vesting of retirement benefits associated with length of service.

Table 4

3SLS Coefficients of Wife's Satisfaction With Army Life and Her Desire for Officer Husband's Retention

Independent Variables	Spouse's Satisfaction with Army life	Sp.'s desire for Officer Husband's Army Career
Intercept	.398	-
Children < 6 years	.030	-
Log of husband's earnings, 1986	.342**	-
Her dissatisfaction with child care cost	-.196*	-
Her labor force participation, months, 1986	-.005	-
Her race, white = 1	-.143	-
Intercept	-	1.854***
Her satisfaction with Army life	-	.374***
Husband's years of service	-	.037***
Her race, white = 1	-	-.05
System weighted R-squared = .444		
F = 12.647***		
N = 2.646		

* Significant at the .10 level
** Significant at the .05 level
*** Significant at the .01 level

Summary and Conclusions

The estimation of a system of four simultaneous equations for spouses of officers revealed that an increase in child care use resulted in an increase in spouse earnings. This, in turn, increased the wife's satisfaction with Army life, and her desire for retention of her husband in the Army. Therefore, in return for the costs of providing child care services, the Army obtains considerable benefits in terms of increased retention of officers. The increased retention reduces the Army's need to recruit and train new officers. The cost of recruiting and training the required new officers, estimated at around $200,000 per Second Lieutenant (Lakhani, 1991), is likely to be considerably more than the cost of providing child care services to Army families.

ANALYSIS OF THE SURVEY OF ARMY FAMILIES, 1991-92

The Survey of Army Families, 1987, or SAF1 data, discussed in the preceding chapters had two major limitations. First, the data were collected prior to the passage of Military Child Care Act, 1989. This legislation required the military to be operationally self-sufficient in the provision of the child care services. In other words, the operating expenditures on the family services are now required to be covered from the operating revenues collected from the fees charged for the use of the services. Hence subsidization of the operating costs by the Army was eliminated after the passage of this Act which came into effect from October 1990. To comply with the law, the Army child care service providers increased the fees from 1 October 1990. Second, the SAF1 survey did not collect economic cost data such as the dollar amounts of payments made by the users to the child care service providers and the hours of child care used for different types of facilities. These limitations were overcome by inclusion of specific economic questions in the Survey of Army Families, 1991/2, also called SAF2. The responses to these questions enable us to analyze the effect of an increase in the cost of child care services on the demand for these services. These are discussed below.

The Economic Questions in SAF2

The SAF2 was conducted by ARI's Army Personnel Survey Office for the U.S. Army Community and Family Center (CFSC) during November 1991 to January 1992. At CFSC's request, ARI's Leadership and Organizational Change Technical Area (Dr. Lakhani) submitted several economic questions, of which the following were included in SAF2:

Q86. Where is your youngest child usually cared for when you or your spouse are not available? Mark one:

1 Nursery/pre-school
2 Elem/Secondary school
3 Child care center on post
4 Child care center off post
5 Family child care home (licensed) sponsored by the Army
6 My own home by himself/herself
7 With baby sitter (trained, not licensed)
8 With neighbor
9 Other

Q87. How much per month do you pay for child care services for your youngest child?

The range of responses varied from $0 to $999.

Q88. How many hours in the last month was your youngest child cared for under this arrangement (your answer to Q86) while you worked, looked for work, or were in school?

The range of responses for this question varied from 0 to 999.

The responses to the last two questions were combined to obtain the economic cost in terms of dollars per hour. It was hypothesized that an increase in the cost would tend to reduce the utilization of child care services by the spouses. This predictor was added to the equations estimated in the preceding chapters. Since SAF2 had a combined sample of only 5,000, including enlisted and officers, and since the response rate was very low with several missing values for the respondents, we combined the enlisted and the officers for our analysis. We believe that such an aggregation is justified because our regression analyses of separate samples in the preceding two chapters revealed that the results were not much different for the two groups.

Sample Description

Survey data from 290 spouses of 164 enlisted and 126 commissioned officers were analyzed in this study. The spouses are a subsample of the SAF2 survey data from 4,897 respondents. The subsample was formed by only including those spouses who reported both having worked for pay at least one week during the past 12 months, and having used at least one hour of child care during the last month. Excluded from the subsample were those who reported being either legally separated or filing for divorce, and those living at the same geographic location as the soldier spouse but not with the soldier spouse. The spouses had worked a mean of 37.8 weeks over the year (with a standard deviation of 16.1, and a median of 45 weeks). They had used an average of 98.7 hours of child care for their youngest child during the last month (with a standard deviation of 68.4 and a median of 84 hours).

Spouses of the enlisted soldiers generally reported soldiers' ranks at E-4 and above. Only 12 (7.3%) of the enlisted soldiers were at ranks of E-3 and below. Seventy-five percent of the officer soldiers clustered at 1st lieutenant, captain, and major ranks.

The spouses in this sample were typically female and mostly White. About one quarter (26.2%, n= 75) described themselves as non-White (Black 18.9%, Asian or Pacific Islander 5.6%, American Indian or Alaska Native 1.7%). Only small proportions of the spouses were male (5.5%, n= 16) or of Hispanic origin (6.2%, n= 18). We retained the male spouses of female soldiers in order to increase the sample size.

The mean number of months spouses reported having lived at their current geographic location was 25.3, with a standard deviation of 17.5 months. A small proportion was stationed in Europe (10.7%, n= 31), and the rest were either CONUS or OCONUS in a location other than Europe. Survey data were not available on who were located OCONUS instead of CONUS for other than those in Europe.

The large majority (93.4%) lived with their soldier spouses. Only nineteen (6.6%) lived apart from the soldier in a different geographic location. Most spouses reported that only one (39.7%) or two (42.1%) dependent children were currently living with them. Another 13.1% reported 3 children, and the remainder (5.2%) either 4 or 5 children. The age of the youngest dependent child among this group using child care fell between 0 and 2 years for 129 spouses (44.5%), between 3 and 4 years for 67 spouses (23.1%), between 5 and 12 years for 93 spouses (32.1%), and between 13 and 17 years of age for only 1 respondent (.3%).

Types of Child Care Used

Of the 290 respondents, 279 indicated the type of child care usually provided for the youngest child when neither the spouse nor the soldier was available. As can be seen in Table 1, 5 of the 9 types of child care listed in the survey were reported used by similar numbers of respondents. Between 10.4% and 12.9% checked the categories of "Nursery/preschool," "Child care center on post," "Child care center off post," "Family child care home (licensed) sponsored by the Army," and "With neighbor". "With baby sitter (trained, not licensed)" was by far the most commonly used category of child care (29.4%). Least used categories were "My own home by himself/herself" (.4%), "Elementary/secondary school" (3.9%), and "Other" (7.9%). The breakdown for type of child care use by officer and enlisted ranks is also presented in Table IV.1. In general, remarkably similar percentages of enlisted and officer spouses made use of each type of child care.

Reported use of each of the types of child care is also presented in Table 5 for the subsample stationed in Europe. Of this small sample of 30 respondents, 26 reported most usually making use of only three types of arrangements for the youngest child: family child care home (33.3%), child care center on post (26.7%), and baby sitter (26.7%).

Table 5

Type of Child Care Used by Officer and Enlisted Spouses

Type of Child Care	Overall n= 279	Officer n= 124	Enlisted n= 155	Europe n=30
	n	n	n	n
With baby sitter (trained, not licensed)	82 (29.4%)	35 (28.2%)	47 (30.3%)	8 (26.7%)
Child care center off post	36 (12.9%)	16 (12.9%)	20 (12.9%)	0 (0%)
Child care center on post	35 (12.5%)	18 (14.5%)	17 (11.0%)	8 (26.7%)
With neighbor	33 (11.8%)	15 (12.1%)	18 (11.6%)	2 (6.7%)
Nursery/preschool	30 (10.8%)	14 (11.3%)	16 (10.3%)	0 (0%)
Family child care home (licensed) sponsored by the Army	29 (10.4%)	13 (10.5%)	16 (10.3%)	10 (33.3%)
Other	22 (7.9%)	6 (4.8%)	16 (10.3%)	2 (6.7%)
Elementary/secondary school	11 (3.9%)	6 (4.8%)	5 (3.2%)	0 (0%)
My own home by himself/ herself	1 (.4%)	1 (.8%)	0 (0%)	0 (0%)

Cost of Child Care

The mean hourly cost of child care across the sample (in 1992) was $2.91. As noted earlier, this cost was estimated by dividing the total dollar amount paid for child care during the past month by the number of hours of child care used during the past month. On average, officer spouses paid more per hour for care of the youngest child ($3.39) than did enlisted spouses ($2.54). This difference, of $.85 an hour more for officer spouses, is an increase of one-third over the enlisted rate.

The mean hourly cost of child care was also lower for the subsample of spouses located in Europe. This subsample paid an average of $2.28 per hour (standard deviation= 2.54) compared to an average of $2.98 (standard deviation= 5.92) for the remaining majority of 259 spouses located CONUS or OCONUS other than Europe. Within the Europe subsample, officer spouses paid more in hourly cost ($2.60) than did the enlisted spouses ($2.11).

The hourly cost of each type of child care, for the total sample and broken down by officer and enlisted rank groups, is presented in Table 2 below. The officer rates ran slightly to considerably higher, excepting those officers who made use of family care homes or "Other" arrangements. Among those relying upon trained sitters, the type of child care most frequently reported by either rank group, officer spouses paid an average of $5.64 per hour compared to $2.64 for the enlisted spouses. In respect to child care centers on and off post, the cost to officer spouses was only slightly higher for on post centers, but markedly higher for off post centers.

Table 6

Mean Hourly Cost of Child Care by Type of Child Care

	Mean Hourly Cost		
	Overall	Officer	Enlisted
Mean	$2.91 n=290	$3.39 n= 126	$2.54 n= 164
By Type of Child Care			
With baby sitter (trained, not licensed)	$3.92 n= 82	$5.64 n= 35	$2.64 n= 47
Other	$3.55 n= 22	$2.32 n= 6	$4.01 n= 16
Family child care home (licensed) sponsored by the Army	$3.09 n= 29	$1.98 n= 13	$4.00 n= 16
My own home by himself/herself	$2.78 n= 1	$2.78 n= 1	- n= 0
Nursery/preschool	$2.38 n= 30	$2.63 n=14	$2.16 n= 16
Child care center off post	$2.33 n= 36	$3.34 n= 16	$1.51 n= 20
Child care center on post	$2.16 n= 35	$2.25 n= 18	$2.06 n= 17
With neighbor	$2.10 n= 33	$2.19 n= 15	$2.03 n= 18
Elementary/secondary school	$1.86 n= 11	$2.38 n= 6	$1.24 n= 5

Cost of Child Care and the Amount Used

The amount of child care used was related to its cost. With greater use, the average hourly cost tended to decrease. The mean hourly cost for the lower, middle, and upper thirds of the sample in amount of child care used over the past month is presented in Table 7. Separate means are also provided for the enlisted and officer subsamples.

Table 7

Relation of Hourly Cost of Child Care to Amount Used During the Past Month

Amount of Child Care	All Ranks	Officer	Enlisted
1 to 45 hours	$5.37 n= 96	$5.63 n= 51	$5.08 n= 45
46 to 150 hours	$1.93 n= 97	$2.17 n= 37	$1.78 n= 60
151-280 hours	$1.45 n= 97	$1.57 n= 38	$1.37 n= 59

Type of Child Care and Amount of Care Used

The amount of child care used also appeared to be a factor in the type of care selected for the youngest child. Those in the middle third of the distribution of hours of child care used during the past month (46-150 hours) made the most even use of the different forms of child care (Table 8). Among those who used child care the least (1 to 45 hours), just three types of care were most frequently mentioned by 67% of the respondents: baby sitter (30%), neighbor (20%), and child care center on post (16%). The 20% (n= 19) in the low use group reporting "with neighbor" for child care represent 57.6% of all those in the total sample selecting this category (n= 33). The low use group was also the least represented among those using child care centers off post and family child care homes.

Those reporting the greatest use of child care during the past month (151-280 hours) were the most likely to make use of nursery/preschool arrangements and the least likely to rely upon neighbors for child care. The 17.7% (n= 17) of the respondents in the high use group selecting the nursery/preschool category represent 56.7% of all those selecting this category in the total sample (n= 30). The percentage of those in the high use group who used baby sitting (33.3%) was similar to that of the low use group (30.1%).

Comparison of child care use in SAF2 with SAF1 data available from Lakhani and Ardison (1991) reveals interesting trends. First, the use of baby sitters (not licensed by Army) decreased from 41% in SAF1 to 29% in SAF2. This is a welcome trend since children tend to develop faster with the use of such formal care as child development centers. Second, the use of child development centers licensed by the Army increased from 10% to 13% whereas that of child development centers not licensed by the Army increased from 3% to 13%. The greater use of private child development centers is attributed to their greater growth during the period 1986-87 to 1991-92. Third, the use of family care homes licensed by the Army remained unchanged at 10%, perhaps because of the greater use of the child development centers. Finally, the use of schools (including nursery schools and pre-schools) increased from 12% to 15%. This last trend is, however, not directly comparable because SAF1 did not break down schools into different categories.

Table 8

Terciles of Hours of Child Care Used Last Month

Type of Care	1-45 n=93	46-150 n=90	151-280 n=96
Nursery/preschool	7.5% n= 7	6.7% n= 6	17.7% n= 17
Elementary/secondary school	4.3% n= 4	7.8% n= 7	0% n= 0
Child care center on post	16.1% n= 15	10.0% n= 9	11.5% n= 11
Child care center off post	5.4% n= 5	16.7% n= 15	16.7% n= 16
Family child care home	7.5% n= 7	11.1% n= 10	12.5% n= 12
My own home by himself/herself	0% n= 0	1.1% n= 1	0% n= 0
With baby sitter	30.1% n= 28	24.4% n= 22	33.3% n= 32
With neighbor	20.4% n= 19	13.3% n= 12	2.1% n= 2
Other	8.6% n= 8	8.9% n= 8	6.3% n= 6
	100%	100%	100%

Child's Age, Amount of Use, Cost, and Type of Child Care

The age of the child was a factor in the amount of care received during the preceding month. The 93 (33%) spouses whose youngest child was between 5 and 12 years of age averaged only 62.7 hours of child care use. In contrast, the 129 (44%) spouses with a child 0 to 2 years, and the 67 (24%) spouses with a child 3 to 4 years, respectively averaged 109.4 and 128.4 hours of use. In short, child care use was the highest in the age group 3-4 years, followed by the 0-2 years age group, and was the least for the age group 5-12 years.

As seen in Table 9 below, some age-related trends influenced the type of child care selected. Nursery/preschool care was most likely to be received by 3 to 4 year olds, followed by 0 to 2 years, with 5 to 12 year olds the least likely. Only children aged 5 tO 12 years received care at elementary or secondary schools. Baby sitters were more frequently used with the 0 to 2 year age category than any other. (Forty-five of the 82 spouses who relied upon baby sitters, or 55%, had a youngest child 0 to 2 years old.)

Categories of child care reported used with approximately equal frequencies among the different age groups were child care centers on and off post, family child care homes, and "other" child care.

Table 9

Age of Child and Type of Care Used

Type of Care	Age Group of Youngest Child		
	0-2 (n=127)	3-4 (n=64)	5-12 (n=87)
Nursery/preschool	11.0% n=14	20.3% n= 13	3.5% n= 3
Elementary/secondary school	0% n=0	0% n= 0	12.6% n= 11
Child care center on post	11.0% n= 14	14.1% n= 9	13.8% n= 12
Child care center off post	12.6% n= 16	12.5% n= 8	13.8% n= 12
Family child care home	9.5% n= 12	12.5% n= 8	10.3% n= 9
My own home by himself/herself	.8% n= 1	0% n= 0	0% n= 0
With baby sitter	35.4% n= 45	25% n= 16	24.1% n= 21
With neighbor	12.6% n= 16	4.7% n= 3	14.9% n= 13
Other	7.1% n= 9	10.9% n= 7	6.9% n= 6

Regression Results and Discussion

It must be noted that in estimating the regression equations with SAF2 data we had to make three compromises because the sample size was very small and there were too many missing values for the required variables. The first compromise was to combine enlisted and officers into a single equation to conserve degrees of freedom in estimating the equations. In order to differentiate the effect of rank, however, we used a dummy variable, with officer = 1, enlisted = 0. Hence the qualitative differential effect can be obtained from the coefficient for this dummy variable. The second compromise was that, instead of estimating the four equations simultaneously, we estimated them separately, as the simultaneous estimation would not iterate to a solution due to the small sample size. A limitation of this method is that the estimates are likely to be inconsistent and inefficient but not biased. The third compromise was to include both the female spouses married to male soldiers and the male civilian spouses married to female soldiers. This inclusion increased the sample size for the required analyses. The results of the four estimated equations are presented in Table 1 to 4 and discussed below.

Table 10, showing the results of the child care use equation, reveals that an increase in hourly cost of child care was associated with a significant decrease in use of child care. Unfortunately, the extent of this decrease cannot be related to the increase in the fees after the passage of Military Child Care Act, 1989, because we did not have the required hourly cost data prior to 1989. Recall that SAF1 did not collect the required economic data. Table 10 also shows that an increase in family income, which included spouse earnings, was associated with an increase in the use of child care services. This table also reveals that the use of child care by spouses of officers was lower relative to use by spouses of enlisted soldiers, and that use was greater in Europe relative to CONUS. This greater use in Europe relative to the use in CONUS has cost implications for the proposed home-basing of Army units from OCONUS to CONUS locations. Child care use was lower for families with a female spouse relative to those with a male spouse, perhaps because female spouses stay home -- to take care of children and hence use less child care, whereas male spouses generally take up civilian jobs and hence use more child care. Finally, as in SAF1, an increase in a spouse's age (in excess of the average age of all spouses in the sample) was associated with a decrease in the use of child care services.

Table 10

Hours of Child Care Used Last Month for the Youngest Child--Regression Results

Variable No.	Name	Parameter	t Ratio
1.	Intercept	247.16**	7.12
2.	Location in Europe	22.95*	1.86
3.	Family Income	.001**	3.59
4.	Officer relative to enlisted	- 29.72*	1.79
5.	Child Care Cost $/hour	- 4.98**	5.41
6.	Soldier's years of service	- 1.44	2.21
7.	Soldier's educational level	- 2.12	0.80
8.	Hispanic Soldier	- 10.68	0.56
9.	Soldier's race, white = 1	- 2.65	0.17
10.	Spouse's sex, female = 1	- 52.06**	2.89
11.	Spouses's race, white = 1	- 17.51	1.13
12.	Eng. first lang. of spouse	- 5.28	0.38
13.	Spouse's educational level	0.49	0.24
14.	Spouse's age	- 3.66**	3.32
15.	# Months at current location	- 0.06	0.24
16.	Has Dep. children less than 1	4.75	0.93
17.	Hours volunteered for civ. or.	0.18	1.04
18.	Wks.worked for pay last 12 mths	0.14	0.45

R-squared = 0.295
F-value = 5.669 **
n=247

* Significant at the .10 level
* * " " " .01 "

Table 11, which includes the spouse's labor force participation rate during the previous year, reveals that the use of child care increased the participation rate significantly. The participation rate was higher in Europe relative to CONUS, as indicated by Table 11 showing that families in Europe used the Army child care services more relative to CONUS. The increased participation rate in Europe appears counter-intuitive, unless the jobs in Europe are in low paying positions, such as in the PX and commissaries. The results also reveal that Hispanic spouses had a greater rate of labor force participation relative to non-Hispanic spouses and that the rate decreased with an increase in the age of the spouses.

Table 11

Weeks Worked for Pay During Last 12 Months--Regression Results

Variable No.	Name	Parameter	t Ratio
1.	Intercept	5.78	0.57
2.	Location in Europe	9.08**	2.97
3.	Soldier's earnings	- 0.0002	0.98
4.	Child care hours used last month	0.03**	2.66
5.	Officer spouse	- 3.61	0.71
6.	Soldier's years of service	0.07	0.22
7.	Soldier's educational level	0.13	0.21
8.	Soldier's race, white = 1	- 5.72	1.58
9.	Spouse's sex, female = 1	- 2.75	0.64
10.	Spouse is Hispanic	9.62*	2.16
11.	Spouse is White	4.65	1.29
12.	Eng. first lang. of spouse	0.24	0.07
13.	Spouse's educational level	0.68	1.42
14.	Spouse's age	0.89**	3.16
15.	Sp. lives at same loc. as soldier	5.86	1.53
16.	Years married	016	0.6

R-squared = 0.179
F-value = 4.533 ***
n = 295

* Significant at the .10 level
* * " " " .01 "

Table 12, showing the results of the spouse's satisfaction with Army life (SAL), reveals that SAL increased with a spouse's satisfaction with child care services. The spouse's SAL also increased with an increase in the soldier husband's satisfaction with Army life. The SAL was, however, lower in Europe relative to CONUS. Finally, the spouse's SAL decreased with an increase in the amount of information received on downsizing in the Army.

Table 12

Spouse's Satisfaction With Army Life--Regression Results

Variable No.	Name	Parameter	t Ratio
1.	Intercept	1.25 *	1.64
2.	Location in Europe	- 0.65 **	3.26
3.	Soldier's income	0.000006	0.41
4.	Soldier's earning last 12 months	- 0.000003	0.43
5.	Hours volunteered for mil. orgns	0.0006	0.17
6.	Hours volunteered for civ. orgns	- 0.0009	0.35
7.	No children in school	0.03	0.20
8.	Child care hours used last month	0.0008	0.87
7.	Satisfied with child care	0.10 *	1.62
8.	Officer's sp. relative to enl sp.	- 0.11	0.33
9.	Soldier's years of service	- 0.007	0.32
10.	Soldier's educational level	- 0.006	0.16
11.	Soldier in Hispanic	- 0.01	0.03
12.	Soldier's race, white = 1	0.22	0.99
13.	Soldier satisfied with type of work	0.33 **	5.71
14.	Increase in amount of info. on downsizing	- 0.08 *	1.83
15.	Spouse's sex female = 1	0.23	0.81
16.	Spouse is Hispanic	- 0.14	0.48
17.	Spouse is White	- 0.08	0.39
18.	Eng. is first lang. of spouse	0.11	0.49
19.	Sp's educational level	- 0.03	1.07
20.	Spouse's age	0.02	0.16
21.	Sp. lives at same loc. as soldier	- 0.11	0.47
22.	Years married	- 0.001	0.008

R-squared = 0.295
F-value = 3.24 * *
n = 236

* Significant at the 0.10 level
* * " " 0.01 "

Table 13, with results for the equation predicting spouse's desire for soldier retention, reveals that an increase in the spouse's satisfaction with Army life is associated with an increase in her desire for the soldier husband's retention in the Army. Therefore, Army policy makers can increase retention by increasing spouses' satisfaction with Army life and, as noted above, one of the predictors of SAL is the spouses's satisfaction with child care. This desire also increases with an increase in the soldier's years of service, which is likely to reflect the perceived retirement benefits of the soldier. The spouse's desire for retention was, however, lower for White spouses relative to non-White, as was noted above with SAF1 data as well.

Table 13

Spouse's Desire for Soldier Retention--Regression Results

Variable No.	Name	Parameter	t Ratio
1.	Intercept	2.33 **	6.26
2.	Location in Europe	0.24	1.48
3.	Soldier's income	- 0.0000002	0.01
4.	Sp's satisfaction with Army life	0.34 **	6.59
5.	Officer's sp. relative to enlisted sp.	0.079	0.32
6.	Solder years of service	0.04 **	2.36
7.	Solder's is white	- 0.22 *	1.85
8.	Spouse's educ. level	- 0.03	1.35
9.	Spouse's age	- 0.28	0.77
10.	Years married	- .004	0.32

R-squared = 0.244
F-value = 8.232 * *
n = 265

* Significant at the 0.10 level
* * " " " 0.01 "

CONCLUSIONS AND LIMITATIONS

The following six conclusions emerged from the analysis of SAF2 data. First, the utilization of child care hours increased with an increase in income. Also, hours of use was greater in Europe relative to that in CONUS child care facilities. This can be attributed to either the unavailability of such facilities in Europe or the language and communication barriers faced by American soldiers in using the foreign child care services. Use also decreased for older spouses and for spouses who were female relative to male spouses. The decrease in use by the older spouses can be attributed to their older children who do not need child care. The decrease in use by female relative to male spouses can be attributed to the fact that more female spouses stay home to take care of their children and hence need less child care. Male spouses tend to work in civilian labor markets and hence use more child care. Third, spouse employment increased when child care use was increased, when the spouse was older, and if the spouse was Hispanic instead of non-Hispanic (White or Black). Fourth, spouses' satisfaction with Army life (SAL) was lower in Europe relative to CONUS. The SAL, however, increased when spouses in Europe or in CONUS were satisfied with child care services. The spouses' SAL also increased if soldiers were satisfied with their work. Fifth, spouses' desires for soldiers' retention in the Army increased if spouses were satisfied with Army life or with an increase in soldiers' years of service. Finally, the spouses of White soldiers were less desirous of retention of their soldier mates in the Army relative to the spouses of Black soldiers.

The SAF2 data has two major limitations which should be overcome in SAF3. First, the response rate of only 33% should be improved by following up the non-respondents either by mailed or by a telephone survey. Second, a scientific weighing procedure for drawing the sample should be designed so that representative data are collected for both male and female spouses of the soldiers. A design for research should also increase representation of minority groups so as to incorporate them in the sample instead of leaving this to a random process in which they are likely to be poorly represented. The absence of such a weighing scheme is likely to bias the results.

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APPENDIX TABLE 1

Descriptive Statistics for Spouses of Enlisted Soldiers (N=1,007)

Variable	Mean	Standard Deviation	Min	Max
Child care used (hrs/month)	60	71.69	0	200
Sp.'s earnings in 1986, $	6,638	6,201	1,500	27,500
Sp.'s satisfaction w/ Army Life	3.49	.99	1	5
Sp.'s desire for soldier retention	3.56	.75	1	4
Sp.'s wage ($/month)	868.61	788.48	136.36	5,500
Age of youngest child	4.6	3.82	1	14.5
# kids < 6 years	.96	1.03	0	6
Dissatisfaction w/ cost of child care	.20	.39	0	1
Labor force participation (months in 1986)	7.58	3.51	2	11
Volunteer time (Hrs last month)	5.51	23.26	0	200
Husband's education (<HSG to college)	3.48	1.65	1	9
Husband's years of service	10.02	6.26	1	22
Sp.'s education (<HSG to college)	3.35	1.91	1	9
Sp.'s age	29.19	6.42	17	45
Race (white=1)	.75	.43	0	1
Soldier's earnings in 1986, $	19,150	5,144	11,545	32,302
OCONUS location	.38	.48	0	1

Source: U.S. Department of the Army (1987)

Appendix Table 2

Descriptive Statistics: Spouses of Officers

Variable	Mean	Standard Deviation	Min	Max
Child care used (hrs/month)	35.76	59.88	0	220
Spouse's earnings in 1986,$	9,765.61	8,098.64	1,500	27,500
Spouse's satisf. w/ Army Life	3.76	.95	1	5
Spouse's desire for soldier retention	3.57	.74	1	4
Spouse's wage ($/month)	1,237.13	1,004.15	136.36	13,750
Age of youngest child	6.20	5.33	1	19
# kids < 6 years	.60	.89	0	6
Dissatisfaction w/cost of child care	.13	.33	0	1
Labor force participation (months in 1986)	7.66	3.45	2	11
Civ. volunteer time (Hrs last month)	19.93	47.14	0	200
Husband's education (<HSG to college)	8.12	1.29	4	11
Sp.'s education (<HSG to college)	5.80	2.20	1	11
Sp.'s age	33.16	7.67	17	45
Sp's Race (white=1)	.93	.26	0	1
Soldier's earnings in 1986, $	36,362.79	9,975.61	18,691.2	56,750.4
OCONUS location	.47	.50	0	1